

detect faults in at least one of a rotary voltage differential transducer (RVDT) and a linear voltage differential transducer based on the determined absolute value.

REMARKS

The Office Action mailed July 30, 2002 has been carefully reviewed and the foregoing amendment has been made in consequence thereof. Submitted herewith is a Submission of Marked Up Claims

Claims 1-18 are pending in this application. Claims 1-18 stand rejected.

The rejection of Claims 1-18 as a double patenting doctrine of prior U.S. Patent Number 6,205,009, is respectfully traversed.

Applicants respectfully submit that Claims 1-18 in the pending application are a separate invention and are patentably distinct from Claims 1-15 of U.S. Patent Number 6,205,009. As is described in more detail below, the Claims in the pending application are directed to a method and apparatus for detecting faults in at least one of a rotary voltage differential transducer (RVDT) and/or a linear voltage differential transducer based on the determined absolute value. The Claims of U.S. Patent Number 6,205,009 are directed to a method and apparatus for detecting faults in a resolver which generates a sine voltage and a cosine voltage.

Claim 1 recites a method for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit, wherein the method comprises the steps of "summing the voltage outputs to obtain a summed voltage value...determining a difference between a current value of the summed voltage value to a reference value...if an absolute value of the difference between a current value of the summed voltage value and the reference value exceeds a freeze threshold, then maintaining the reference value constant...detecting faults in at least one of a rotary voltage differential transducer (RVDT) and a linear voltage differential transducer (LVDT) based on the determined absolute value." The method of Claim 1 is therefore directed to a method for detecting faults in either an LVDT or in a RVDT. Claims 2-5 depend from Claim 1.

Claims 1-15 of U.S. Patent Number 6,205,009 do not recite a method for detecting faults in either an LVDT or in a RVDT. Rather, Claims 1-15 of U.S. Patent Number

6,205,009 recite a method and apparatus for detecting faults in a resolver which generates a sine voltage and a cosine voltage.

Claim 6 recites apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, wherein the transducer is electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, and wherein the apparatus comprises "a short term filter for generating a first voltage value...a long term filter for generating a second voltage value ...a summer for generating a difference signal... said apparatus configured to detect faults in at least one of a rotary voltage differential transducer (RVDT) and a linear voltage differential transducer based on the difference signal. The apparatus of Claim 6 is therefore directed to an apparatus configured to detect faults in either an LVDT or in a RVDT. Claims 7-14 depend from Claim 6.

Claims 1-15 of U.S. Patent Number 6,205,009 do not recite an apparatus configured to detect faults in either an LVDT or in a RVDT. Rather, Claims 1-15 of U.S. Patent Number 6,205,009 recite a method and apparatus for detecting faults in a resolver which generates a sine voltage and a cosine voltage.

Claim 15 recites an apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, wherein the transducer is electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, and wherein the apparatus comprises "a short term filter for generating a first voltage value...a long term filter for generating a second voltage value...a summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value... said apparatus configured to detect faults in at least one of a rotary voltage differential transducer (RVDT) and a linear voltage differential transducer based on the determined absolute value. The apparatus of Claim 15 is therefore directed to an apparatus configured to detect faults in either an LVDT or in a RVDT. Claims 16-18 depend from Claim 15.

Claims 1-15 of U.S. Patent Number 6,205,009 do not recite an apparatus configured to detect faults in either an LVDT or in a RVDT. Rather, Claims 1-15 of U.S. Patent Number 6,205,009 recite a method and apparatus for detecting faults in a resolver which generates a sine voltage and a cosine voltage.

Accordingly, for the reasons set forth above, Applicants respectfully request that the double patenting rejections of Claims 1-33 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Cook et al.

Serial No.: 09/552,563

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For: CONTROL SYSTEMS AND
METHODS

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: Art Unit: 2858
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: Examiner: Patel, P.
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OFFICE OF PETITIONS

SUBMISSION OF MARKED UP CLAIMS

Commissioner for Patents
Box DAC
Washington, D.C. 20231

Sir:

The attached are marked up Claims in accordance with 37 C.F.R. Section
1.121(c)(1)(ii):

IN THE CLAIMS

1. (twice amended) A method for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit, said method comprising the steps of:

summing the voltage outputs to obtain a summed voltage value;

determining a difference between a current value of the summed voltage value to a reference value; [and]

if an absolute value of the difference between a current value of the summed voltage value and the reference value exceeds a freeze threshold, then maintaining the reference value constant; and

detecting faults in at least one of a rotary voltage differential transducer (RVDT) and a linear voltage differential transducer (LVDT) based on the determined absolute value.

6. (three times amended) Apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, said apparatus comprising:

a short term filter for generating a first voltage value representative of a current value of a sum of the secondary winding output voltages;

a long term filter for generating a second voltage value representative of a non-faulted value of a sum of the secondary winding output voltages, at least one of said short term filter and said long term filter configured to maintain said second voltage value constant; and

a summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value, said apparatus configured to detect faults in at least one of a rotary voltage differential transducer (RVDT) and a linear voltage differential transducer based on the difference signal.

15. (twice amended) Apparatus for detecting faults in a transducer including a secondary winding having at least two voltage outputs, the transducer being electrically connected to a logic circuit implemented in at least one of an on-board interface and an on-board controller, said apparatus comprising:

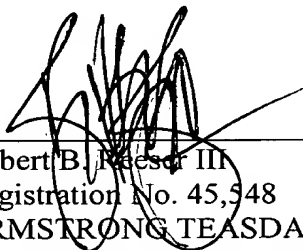
a short term filter for generating a first voltage value representative of a current value of a sum of the secondary winding output voltages, said short term filter comprising a one pole lag filter;

a long term filter for generating a second voltage value representative of a non-faulted value of a sum of the secondary winding output voltages, said long term filter comprising a one pole lag filter; and

a summer for generating a difference signal representative of a difference between the first voltage value and the second voltage value, if an absolute value of the difference between the first voltage value and the second voltage value exceeds a freeze threshold, then said long term filter maintains said second voltage value constant, and if the absolute value of the difference between the first voltage value and the second voltage value exceeds a fault threshold, then said apparatus generates a fault indicator signal, said apparatus configured to

detect faults in at least one of a rotary voltage differential transducer (RVDT) and a linear voltage differential transducer based on the determined absolute value.

Respectfully Submitted,

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